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Effect of Pollution on the quality of Yamuna river water.

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Abstract: According to the local environment activist and research persons working on problem of acidification, industrial and factory effluents, sewage and agricultural wastes and the toxic substances secreted by the above said resources are the main causes for water pollution in Yamuna river water. Yamuna water is commonly used for agricultural fields in adjoining areas. Several micronutrients are heavy metals and known to produce undesirable effects on plants at higher concentrations. When the toxic metals inhibits the metabolic process and important physiological activities in the plants the growth and survival of the plant becomes a difficult task.

Key words: pollution , BOD, COD, industrialization , toxicity,

I. Introduction

Indiscriminate discharge of untreated or partially waste water directly or indirectly into aquatic bodies may under water resources unwholesome and hazardous to man and other living systems. Tannery effluents are ranked as the highest pollutants among all `industrial wastes. Unfortunately only fraction of chromium (Cr) is utilized in tanning process and rest is discharged as byproduct of wastewater treatment**(Pandey et al., 2013)**. Therefore, the treated wastewater discharged from tanning industries contains high level of BOD, COD, electrical conductivity and heavy metals especially Cr above permissible limit as recommended by various regulatory agencies making it potentially toxic **(Kaushik et al., 2009)**. Among different industries and factories the waste and effluent discharged from the tanning industry are mostly goes into rivers due to which they are used in irrigation purpose for different crops and vegetables cultivated in that particular area. By the continuous use of such contaminated water there is accumulation of toxic metals in the plants and subsequently transferred to human beings. Among different metals Cr is considered as a primary agent of cancer, basically it enters in the cells of human being and animals and inducing genotoxicity in the body of that individual (**Eleni et al., 2011)**.

By use of heavy metal contaminated water there are several complications such as reduced root growth, biomass, seed germination, early seedling development, and induces chlorosis, photosynthetic impairment and finally leading to plant death. Residues of organo chlorine pesticides including HCH, DDT, endosulfan and their metabolites are common in the water of river yamuna. Studies on heavy metal concentration in water (**Srivastava et al., 2010)** show that the uppermost stretch is relatively free from different metals. The middle stretch, receiving different effluents, is heavily polluted with the metals. Although a significant stretch of the estuarine zone is densely industrialized and receives effluent regularly, dilution by large flows reduces their concentration. In majority of cases, the observed levels are much higher than the US EPA permissible limits for the aquatic organism **(Kumar et al., 2013)**.

Waterborne infections are the most common causes of morbidity and mortality in the under developed and developing countries and 80% of the infectious diseases are waterborne in India. Most of the rivers in urban areas of the developing world are the end points of effluents discharged from the industries Pulp paper industries are the sixth largest effluent generating industries of the world, as these generates as low as 1.5 m3 of effluent per tone to as high as 60 m3 tone of paper produced. These effluents have been found to contain more than 200-300 different organic compounds and approximately 700 organic and inorganic compounds. Organic and inorganic contents of the effluent provide ample opportunity to flourishing a variety of pathogenic microorganism. Due to high chemical diversity of the organic pollutants in paper and pulp mill process water, a high variety of toxic effects on aquatic communities in recipient watercourses have been observed. A significant number of these substances have been classified as carcinogenic, mutagenic and clastogenic and endocrinic. Use of antibiotics to combat these infections is a common practice, but indiscriminate use of antibiotics leads to drug resistance in these microbes, which warrants the initiation of steps to prevent public health hazard (**Kumar et al., 2014)**.

Heavy metals have long been recognized as major pollutants for both of aquatic and terrestrial habitats. They may affect organisms directly by accumulating in their body or indirectly by transferring to the food chain. Most of these metals are highly toxic and no know biological function. Hence, they tend to accumulate in soil, sediment and different tissues of plant and animals. They can cause inhibition of photosynthesis in water

plants, effect on phytoplankton growth in water, cause to chromosomal aberrations in terrestrial plants and induce carcinogenesis in human. Despite regulatory measures carried out in many countries, heavy metals continue to increase in the environment (**Danazumi and Bichi., 2010)**. Water quality is determined by the solutes and gases dissolved in it, as well as the matter suspended and floating on the water. The water quality is a consequence of the natural, physical and chemical state of the water as well as any alteration that might have occurred as a consequence of human activity. The usefulness of water for a particular purpose is determined by the water quality. If human activity alters the natural water quality so that it is no longer fit for a use for which it had previously been suited, the water is said to be polluted or contaminated **(Sehgal et al., 2012)**.

Water has become an essential commodity for the development of industries and agriculture. Owing to increasing industrialization on one hand and exploding population on the other, the demand for water sup-ply has been increasing tremendously. Sewage, industrial wastes and a wide array of synthetic chemicals also pollute this limited quantity of water **(Puthiyasekar et al., 2010).** Rapid growth of urban population results in generation of huge quantities of wastewater perennially. In our country the treatment facility of the industry and factory effluents are not up to the mark, In other words we can say that not more than 30% of the total discharged are treated before it goes in our different water systems such as lakes, rivers and ground water etc. Now days the availability of fresh drinking water becomes scarce moreover all the parts of our country mainly in those areas in which rivers are the primary source of drinking water **(Ahmad et al., 2010**).

River water and ground water are the primary source of irrigation in our country but by the use of contaminated water the salinity problem is increasing day by day. As we know that the effluents of different factory contains heavy metals traces, in small amounts or in minute concentrations these heavy metals can be used for increasing fertility of low fertile soils. Practically if we do some research on the water profile of the river water then we can use more effectively for the irrigation purpose because whole river water is not extremely polluted or toxic, in those areas in which the concentrations of heavy metals are not so high that they can be considered toxic the waste water provides organic matter and some micro nutrients such as N, C and P to the soils. By this technique we can take double use of waste water firstly the problem of water for irrigation is solved and secondly the use of fertilizers in cropping system can be minimized by the use of such water (**Upadhyay et al., 2010**).

In cultivation of different crops such as cereals and pulses the use of waste water is not so much of worries but if we talk about vegetables then there is some serious problems which are associated regarding the quality of grown vegetables in these areas because as we know that in terms of vitamins, fibers and minerals vegetables are a very good source and for cultivations of vegetables we need good fertile soils and better irrigation facility. Farmers regularly use this waste water for irrigation of vegetables crops such as cabbage, carrot, radish, tomatoes, lettuce, chilli in which some are used as salad and some are used after cooking them. But by using waste water there is a always chance of transportation of toxic elements from plants to humans, among different toxic elements Cu, Fe, Cd, Pb are the major ones comes from waste water **(Kaushik et al., 2009**).

II. Conclusion

The continuous use of contaminated water not only causing diseases in humans and animals but they are the primary source of creating deterioration in soil health also. However if we can improve our treatment facilities by increase the number of treatment plants or we can make them compulsory for each factory and industry whose waste goes down in rivers or lakes then we can make better use of waste water effectively (**Suthar et al., 2009**). In rural and urban areas, the groundwater is main source of drinking water; however, more than 80% diseases of the man-kind are waterborne (**Agrawal et al., 2010)**. The concentration of fluoride between 0.6 and 1.0 mg/L in potable water protects teeth decay and enhances bone development**.** However, excessive fluoride intake through the drinking water causes awful disease of fluorosis. It is suggested that a tolerance limit of 1.5 mg/L. In India 15 States have been identified as endemic States and Maharashtra is one of them. It is observed that out that more than 62 million people from India are suffering from different kinds of fluorosis. Fluoro-sis is manifested in three main types. Dental fluorosis manifests in the form of pitting of teeth, opaque patches, chalkiness, staining, chip-ping of enamel, etc. The skeletal fluorosis causes pain in the neck, joints, back, etc. With increase in severity of skeletal fluorosis pain becomes associated with rigidity and restricts movement of cervical and lumbar spine, shoulder joints as well as knee and pelvic joints **(Nallathiga et al., 2011)** have propounded non-skeletal fluorosis in the form of neurological, muscular, allergic, gastrointestinal ailments as well as headache and urinary tract infections.

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